THE VALLEY REPORT

The role of the Corps of Engineers in the formulation and implementation of programs for flood protection evolved as a logical extension of the Corps' traditional function in the improvement of the nation's waterways. The early water-related civil works projects dealt almost exclusively with improvement of navigation; the related problems of stream flooding were given little study prior to the establishment, in 1902, of the Board of Engineers for Rivers and Harbors.

The first flood Control Act, in 1917, linked navigational responsibilities with flood control and brought the Corps officially into a new area of responsibility. In 1928, the first large-scale federal works of flood control were constructed by the Corps in the Mississippi River Valley after the disastrous flood of 1927, which brought about the Flood Control Act of 1928 and triggered the first effort by Federal government to undertake a country-wide appraisal of all water resources problems. The surveys which followed[1] were general in nature and were intended by the Corps of Engineers as guidelines for an overall program. They were used, however, as the basis for specific authorizations contained in the first general Flood Control Act in 1936.

Policy concepts for Federal flood control were spelled out in two important statements of the 1936 Act:

> *1. That flood control is a proper Federal function and that the Federal Government should improve or participate in the improvement if the benefits to whomsoever they may accrue are in excess of estimated costs.*
>
> *2. That a flood control program is justified if the lives and social security of people are otherwise adversely affected.*

These basic precepts, along with the watershed concept of water resources utilization, framed the essential formula for the considerable number of improvement projects which followed.

The make-work programs of the depression thirties included numerous projects related to conservation and control of the nation's water resources. Much experience was gained through them in construction of flood control structures and in the basics of watershed management. Expenditures of large sums of public funds during that period for protection of people and natural resources significantly affected general recognition of government's responsibility in the maintenance of the public's welfare. The widespread flooding which occurred in Pennsylvania in March 1936 again focused attention on the importance of formulating broad measures for flood control.

A four-state government agency was organized in 1936 "for the purpose of entering upon a program—to develop integrated plans to conserve and protect the waters and other resources of the Delaware River Basin". The member States: New Jersey, New York, Pennsylvania and Delaware cooperated as the Interstate Commission on the Delaware River Basin (INCODEL).

A resolution by the United States Senate Committee on Public Works, adopted April 13, 1950, requested the Board of Engineers for Rivers and Harbors to review the "308" survey for the Delaware River[2] and determine the advisability of its modification. The reso-

lution was the first of seven authorizing an investigation which initiated a series of surveys extending over a 10-year period, the final results of which were published as House Document 522, 87th Congress, 2nd Session, and titled *"Report on the Comprehensive Survey of the Water Resources of the Delaware River Basin."* The Philadelphia District was assigned the task of coordinating the survey studies and of preparing the report in its final form.

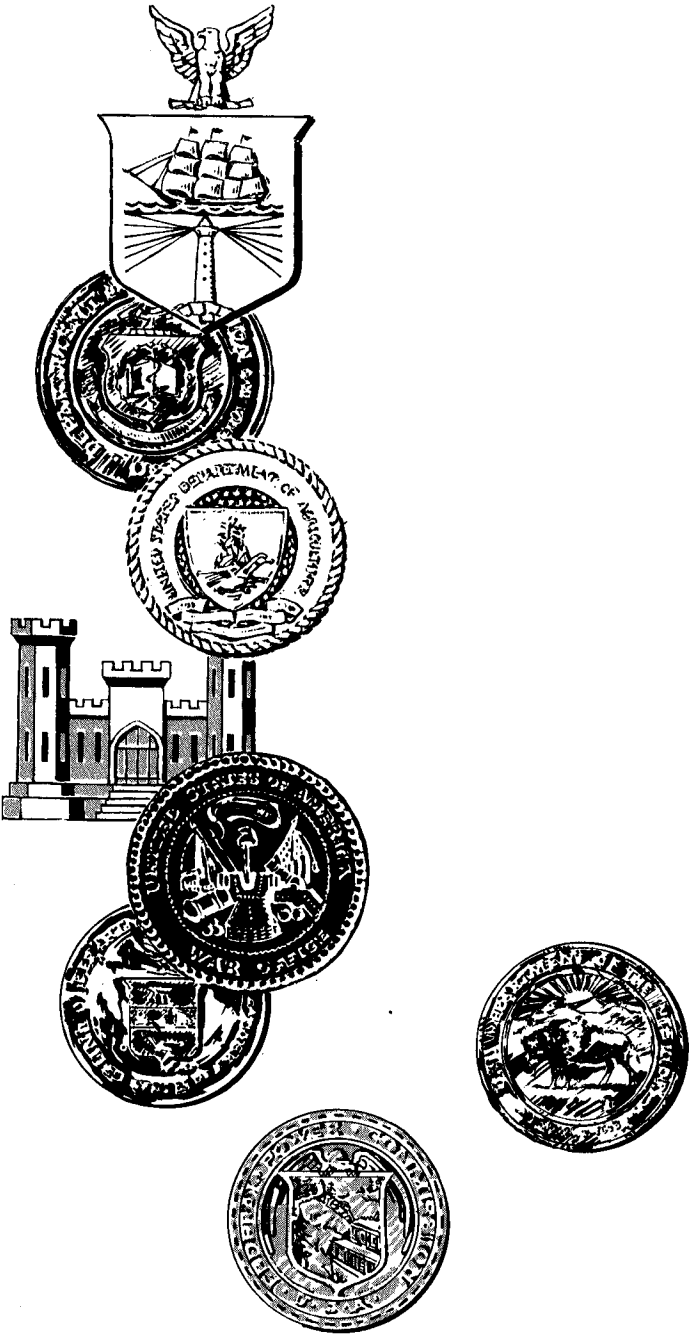
The project, known in the District as the *"Valley Report,"* was formally launched at a public hearing held July 19, 1950 in Philadelphia and attended by 48 persons whose interests were presumably most vitally affected. The sense of the meeting, extracted from the digest of the minutes, indicates a public mood of caution and defensiveness, due partially to limited comprehension of the effects of the proposed main stem dams.

The peculiar implications of a plan affecting the vital interests of four states stimulated the organization of variously oriented control groups, some intended solely for local protection, others attempting to coordinate planning for the mutual benefit of the four-state partners. Power groups bestirred themselves to probe, oppose and/or offset real or imagined repercussions of anticipated Federal electric power generation in the Delaware Valley. Pennsylvania and New Jersey enacted legislation to permit construction of a dam on the Delaware at Wallpack Bend as a mutual state venture. On June 2, 1951, the State of Delaware acted to establish a Delaware River Basin Water Commission, contingent upon similar action by New York, New Jersey and Pennsylvania. Three weeks later, New Jersey passed a similar act, to become effective only if the commission should include all four states. New York approved an act to form such a commission in August 1952, but Pennsylvania held out until July 19, 1955.

Before the proposed interstate commission could come into being, the Delaware basin received the disastrous impact of two closely-spaced hurricane storms. Torrential rains saturated the watershed during the second week of August 1955 in the onslaught of hurricane "Connie." On August 18, hurricane "Diane" swept in, her rains increasing run-off in the valley to major flood proportions. Damage was widespread and severe; the regions affected, centering in the Pocono Mountains, were designated major disaster areas by President Eisenhower and on August 23, the Corps of Engineers was assigned the engineer function for relief: "Operation Noah." The clean-up work of succeeding weeks, supervised by a Philadelphia District engineer team, entailed emergency expenditures of six and a quarter million dollars. The cost to the region in tangible assets was estimated at $100,000,000; one hundred lives were lost.

The floods of August 1955 did, in fact, mark a major turning point in the scope and procedural emphasis of the investigations under way in the Delaware Basin.

The tentative, preliminary version of the Valley Report which had been forwarded to the Chief of Engineers on July 7, 1955, was returned to the District on August 22 for reconsideration in view of the recent floods. Reaction to the "Connie"—"Diane" disaster brought about further resolutions of the



Senate Public Works Committee, calling for specific flood protection measures and a general re-evaluation of the recommendations already proposed.

The Delaware River Basin Survey Commission came into being through agreement of the Governors of Delaware, New Jersey, Pennsylvania and New York and the Mayors of Philadelphia and New York City, and met for the first time in March 1956.

A field survey of flood damages was undertaken by a firm of consulting engineers under a District contract; its findings were forwarded to Valley Report group engineers by the end of 1955. In January 1956 four public hearings were held, to determine the views of local interests and to further assess flood damage in the highly affected areas. These meetings were attended by people crucially involved in the activities and public affairs of the watershed, whose expressed concerns embraced a wide range of water-related problems.

The fourth resolution of the Senate Public Works Committee affecting the basin investigation was adopted in February 1956. It initiated action leading to feasibility studies by the District of a main stem dam and reservoir on the Delaware River, a project which was to become the paramount feature in the comprehensive survey. (Originally designated as "above Delaware Water Gap near Wallpack Bend or Tocks Island," the site search was pursued by every available method of engineering, geologic and economic test for a dozen years. It was eventually located at Tocks Island and became the principal structure of a project which had exceeded merely

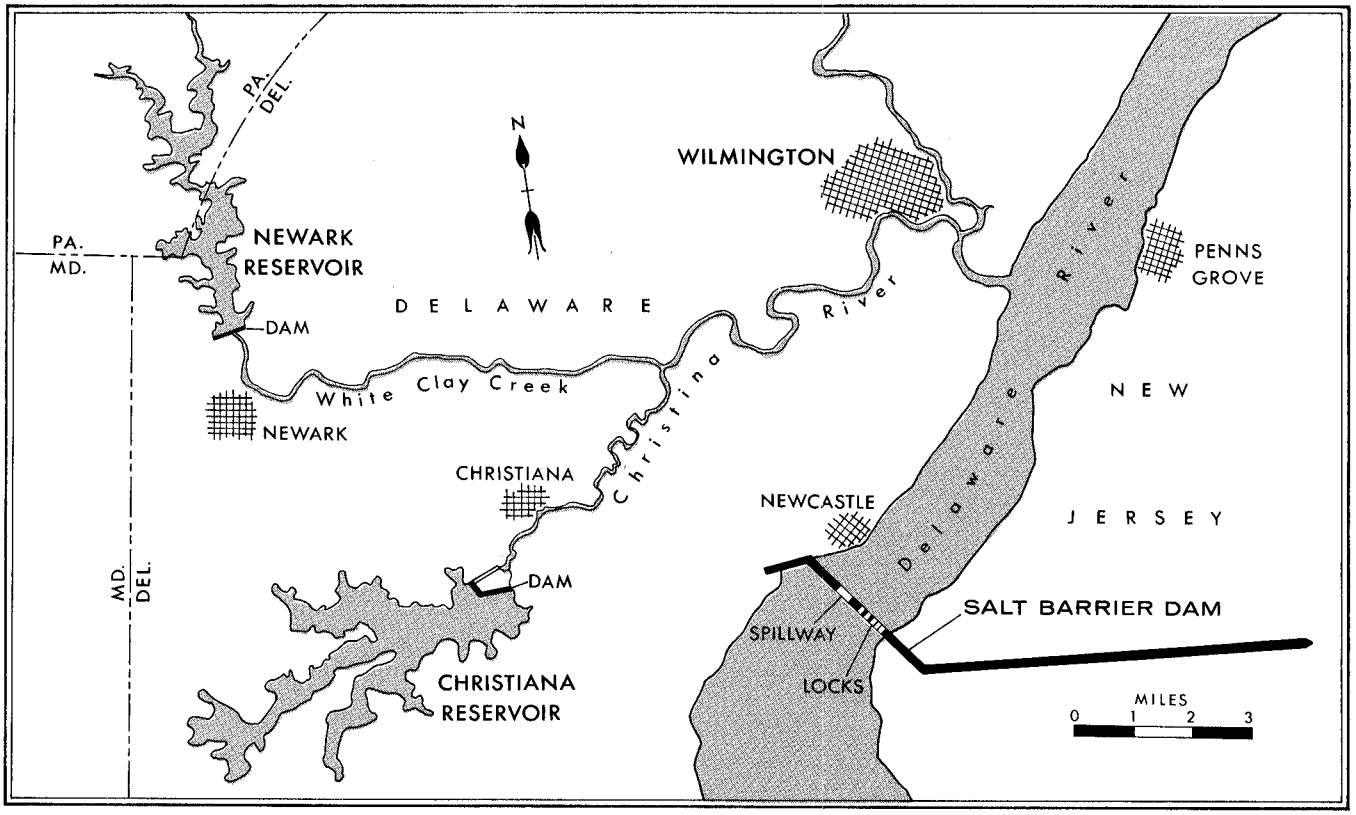
Studies to seek solutions of Delaware's water needs embraced proposals for two fresh water reservoirs and the controversial salt barrier. Proposed Newark and Christiana Reservoirs were included in the Comprehensive Basin Plan; the salt barrier investigation assumed aspects of a Pandora's Box and was curtailed after the initial surveys.

regional importance by its new designation as the *Delaware Water Gap National Recreation Area.)* The recently constituted four-state *Delaware River Basin Survey Commission* met to restate its objectives; the new emphasis was symbolized in its revised title, in which "Advisory" was substituted for "Survey."

On April 2, 1956 the District distributed copies of its Procedural Plan to all agencies cooperating in the Basin survey. The plan, though labeled "preliminary," essentially contained the elements and scope ultimately resolved and reported; it aspired to "consider the (water) demands and uses of the present (1960), those for the long-range future (at least 2060) and phased increases between these two limits." It proposed assessment in depth of the water-related problems of industry and commerce, of agriculture, navigation and recreation. Other objectives were: to probe the potential of hydroelectric power development and uses; to determine the environmental needs of fish, wildlife and the control of salt intrusion; to study the economics of pollution abatement and project the domestic water demands of a population expected to double within a half century.

Flood control was still basic to the program; a review of survey scope was required by the Chief of Engineers, and assigned to the Philadelphia District; its coverage of the Delaware River and its tributaries, to embrace "the engineering and economic aspects of flood control, water supply, low-flow regulation, hydroelectric power and allied uses of water." The Secretary of the Army stressed the role of the Corps of Engineers as being mainly that of coordinator in the development of the Comprehensive Basin Plan, since many of the requisite functions were outside the Department of the Army's sphere of authority and much of the work would be carried out by other agencies and non-federal interests. President Eisenhower sent a directive dated October 22, 1956 to the Secretary of the Army, urging extended efforts to utilize the technical resources of Federal agencies and of state and local governments in preparing the Basin Study. Subsequently, the *Delaware Basin Survey Coordinating Committee* was constituted, its members comprising representatives of the Departments of Interior, Commerce, Agriculture, Labor, and Health, Education and Welfare. Representatives were delegated by the Federal Power Commission, the Commonwealth of Pennsylvania and the States of Delaware, New Jersey and New York and for the Cities of New York and Philadelphia. The Committee was chaired by the District Engineer, Philadelphia District Corps of Engineers, for the Department of the Army.

Authorizations, guidelines and organizational structures were fairly established by the end of 1956 and, in 1957, the productive final study and review period began. The District, as author agency, set up the lines of communication and promoted the numerous inter-agency conferences, reviewed and edited reports submitted by the cooperating study groups and negotiated the resolution of differences where divergent interpretations occurred. The District Engineer, or his authorized deputy, conducted the ten official meetings of the *Delaware Basin Coordinating Committee*, assisted by a capable Valley Report Group staff. The first meeting, held on April 2 - 3, 1957 at Atlantic City, New



Jersey, was opened by Chairman Colonel Allen F. Clark, Jr., who suggested the Quaker way of conducting meetings[3] as a substitute for conventional parliamentary procedure. The profusion of agenda which filled and overflowed the next three years of activity concerned a range and scope of situations not previously undertaken by the Federal Government for a regional water resources survey.

The Senate Committee on Public Works adopted a resolution in April 1958 calling for feasibility studies for a salt barrier in the Delaware River Estuary. The primary purpose of the structure was to provide fresh water supplies for Delaware and in particular for the Wilmington metropolitan area, where the potential for the accelerated growth of population and industry were considered to be the greatest in the Delaware Basin. The District's Valley Report Group prepared a preliminary report which indicated the complexity and far-flung consequences of such a project. The proposed structure, to span the river at a location 3,500 feet downstream from New Castle, Delaware, consisted of levees, earth embankments, locks, spillways and a sump and drain system.

Effective storage of 250 billion gallons of fresh water, available at the shoreline, was an amiable prospect to the water-poor State of Delaware. However, the inevitable effects of such a barrier on ship movements, icing, and the entrapment of sanitary outfalls could only begin to be estimated. Ground water supplies in Delaware and New Jersey would probably have been augmented by retention of the large pool; elimination of dense saline intrusions would have been welcomed by upstream municipal water commissions. But Navy spokesmen were quick to object that lockage would nullify the strategic effectiveness of naval vessels in the estuary and biologists feared that any inhibition of the tidal regimen would be seriously detrimental to the estuarine ecology.

The preliminary report concluded that it would be physically feasible to construct, operate and maintain a barrier across the Delaware estuary and that the barrier would effectively impound fresh water and prevent salt intrusion. The first cost of the project was estimated at $345,000,000; an alternative scheme to satisfy the area's water needs at half the cost involved diversion of water from the Susquehanna River through a pressure

tunnel. Two of the major control projects in the proposed Watershed Plan of Improvement, Newark Reservoir on White Clay Creek and Christiana Reservoir on the Christina River, were cited as alternative sources of fresh water supply. The apparent high cost was not the most prohibitive aspect of the barrier project; every step of the investigation had served to reveal the intricate ramifications raised by the project. An exhaustive survey was deemed essential before any recommendatons could be made; such a study would have required at least two years of preparation at a cost of over two million dollars. With the target date for completing the comprehensive basin survey less than a year away, postponement of the basin survey seemed inadvisable, and it was decided to include the tentative survey in the final report without recommendations.

Appendix "P" of the comprehensive survey report contained an analysis of "gross and net water needs" in the Delaware River Basin. A statement in the syllabus of Appendix "P" declared that "the growth of water use in this basin is expected to accelerate rapidly during the next fifty years. Commensurate with projected increases in population, industrial and agricultural activity, and standards of living, the gross water needs of this basin are expected to exceed four times the present needs, reaching a daily basin-wide requirement of thirteen billion gallons by the year 2010." Therein lay the crux of the whole water problem—the provision of water supply adequate for future needs.

In Appendix "Q—Formation of the Plan of Development," the Valley Report Group presented an integrated assembly of concepts and solutions for comprehensive long-range development of the water resources within the Delaware Basin. The overall scheme, evolved without any strict or formalized precedent, analyzed the multiple uses of three classes of control structures, specifically sited throughout the watershed. Eleven major dams were proposed, each to embody the multiple functions of water supply, flood protection and recreation. Tocks Island Dam, one of the eleven, would also supply hydroelectric power. These projects were to be fully operative prior to the year 2010. A second group of eight projects planned for construction before 2010 was to be used solely for recreation, and expanded for other purposes as needed after 2010. In addition, 39 small dam projects, selected from the 386 potential sites evaluated, were included in the Plan of Development.

As fiscal 1960 drew to a close, the Valley Report received its final editorial touches. Prompton Dam, one of the Report's major control projects was within a month of becoming operational. Bear Creek Dam[4], designed to impound 35 billion gallons of water, was approaching completion and would be dedicated on June 10, 1961. An important flood control structure had been built a few miles from Prompton Dam and dedicated on August 19, 1959 as Dyberry Dam, (later renamed General Edgar Jadwin Dam). The Comprehensive Basin Plan had begun to take substantial form even before the Report was collated, not only through the design and construction of water control stuctures, but also through a myriad of other projects set in motion by the Survey's collaborative efforts. Tangible benefits had to

derive from a document shaped by the coordinated, intensive research of a great many committed concerned persons, over a ten-year period. The coordination of the desires, dreams and purposes of so many area spokesmen and government agencies ranked as one of the more notable performances of the District, and satisfied a wish expressed by the President in a letter to the Secretary of the Army: "*. . . I have in mind more than the customary circularization of completed reports as now required by law and by executive orders. I desire that your Department, through the officers responsible for the direction of the survey, establish arrangements and procedures which will assure a full and continuing exchange of views and information among the parties concerned.*[5]" That was essentially the way it was done.

The ultimate measure of the report's merit lay not solely in the magnitude of the solutions, projections and statistics which issued forth, but equally in the degree to which a primary goal had been achieved: the formulation of a living document. While statistics would change, writing variations on the solutions, they would not impair the vitality of the Report itself.